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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/727,958	12/04/2003	Shogo Kiyota	5332-8PCON	7410
27799 7590 04/04/2007 COHEN, PONTANI, LIEBERMAN & PAVANE 551 FIFTH AVENUE SUITE 1210 NEW YORK, NY 10176			EXAMINER DAHIMENE, MAHMOUD	
			ART UNIT	PAPER NUMBER
			1765	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/04/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/727,958	Applicant(s) KIYOTA ET AL.	
	Examiner Mahmoud Dahimene	Art Unit 1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 March 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Withdrawal of Finality

Applicant's arguments, see page 2, filed 3/02/2007, with respect to the rejection(s) of claim(s) 1-13 under 35 USC § 103 have been fully considered and are persuasive in view of the reference of Akatsu was published on 9/14/2001 (not before applicant's claimed priority of 6/4/2001). Therefore, the rejection and finality has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Nakaya et al (US 6,188,176).

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

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not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wada et al. (US 6,787,989) in view of Nakaya et al (US 6,188,176).

Regarding claim 1 and 2, the reference Wada describes a substrate with a transparent conductive film is provided, which has a high work function and an excellent surface smoothness as well as a reduced specific resistance to thereby ensure a reduced power consumption and enhanced display quality. An ITO film 2 is formed on a glass substrate 1 by an ion plating method by using an ITO sintered compact with an SnO.sub.2 content of 4 to 6 wt %. The ITO film 2 obtained as above has a surface roughness range of 1 to 10 nm which overlaps applicant's claimed range of 0 to 8 nm. Overlapping ranges are held obvious.

It is noted that Wada is silent about the smoothness (roughness) of the substrate.

Nakaya discloses an organic EL preparation method wherein "On a substrate of Corning (7059) glass, an ITO transparent electrode (hole injecting electrode) was deposited by sputtering as in Experiment 1, which electrode was the same as Sample No. 1. The glass substrate had a surface roughness: $R_a \leq 0.68$ nm and $R_{max} \leq 2.0$ nm (column 13, line 46) which is included in the applicant claim range of 0 to 4 nm. Overlapping ranges are held obvious. Nakaya is silent about any substrate polishing step.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process Wada by controlling the surface roughness of the substrate because Wada teaches lower roughness is desirable and substrate smoothness helps achieving a desired smoothness on deposited layers. One of ordinary skill in the art would have been motivated to choose a high substrate surface smoothness of 0 to 4 nm in order to obtain a deposited layer with high smoothness.

Claim Rejections - 35 USC § 103

1. Claims 3, 4, 5, are rejected under 35 U.S.C. 103(a) as being unpatentable over Wada et al. (US 6,787,989) and Nakaya et al (US 6,188,176).as applied to claims 1 and 2 above, and further in view of Ikeda et al. (US 6,553,788).

Regarding claims 3 and 4, it is noted that the reference of Wada is silent about the surface of the transparent substrate is subjected to an acidic aqueous solution containing hydrofluoric acid or an alkaline aqueous solution containing potassium hydroxide or sodium hydroxide, and the surface of the transparent substrate is subjected to alkaline washing comprising using an alkaline liquid.

The reference of Ikeda teaches a method of manufacturing a transparent substrate where scrub-etching is used to smooth the surface of the substrate and forming a fine texture free of asperity in which the average surface roughness Ra is in a range between 0.4 and 3.0 nm and the ratio of the 10-point mean roughness (Rz) to the average surface roughness (Ra) is 14 or less. In example 4 (column 9, line 35) Ikeda cites "Then, the glass substrate was immersed in a 0.03 wt % aqueous

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hydrofluoric acid solution at 50.degree. C. for 30 minutes and rinsed with hot pure water to remove chemicals. Next cleaning in an aqueous potassium hydroxide solution was performed".

It is noted that Ikeda uses scrub-etching, however, Ikeda uses scrub-etching to bring the roughness from a higher value to a much lower value, then follows with immersion (without scrubbing) in hydrofluoric acid solution, and later in potassium hydroxide solution for cleaning.

Nakaya is silent about the substrate using any scrubbing or polishing to obtain the desired smoothness, however, it would appear that Nakaya substrate could also benefit from the processing steps of Ikeda involving immersion (without scrubbing) in hydrofluoric acid solution and later cleaning in potassium hydroxide solution as described in example 4.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify the process of Wada by adding the two processing steps of Ikeda as described above because Ikeda teaches the hydrofluoric acid immersion improves the smoothness (column 8, line 10) and the potassium hydroxide cleans the substrate. One of ordinary skill in the art would have been motivated to add the two steps of Ikeda in order to obtain a smoother and cleaner substrate which is desirable for further EL formation.

As to claim 5, It is noted that Wada is silent about polishing.

Ikeda describes a method for manufacturing a magnetic disk from a transparent glass substrate using polishing or scrub-etching to obtain a smoothness Rz less or equal to 4 nm as defined by a surface roughness Ra in a range from 0.4 nm to 3 nm and a ratio of of a 10-point mean roughness Rz to the average surface roughness Ra of 14 or less (meaning $Rz/Ra = 14$ or less) (see claim 1) which yields (after calculation) an Rz values of 5.6 nm or less (calculated when $Ra = 0.4$ nm and $Rz/Ra < 14$) which includes an Rz value of 4 nm or less.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process Wada and perform further post polishing treatments such as in example 3 (column 9, line 14) until a value of less than 4 nm is reached for Rz because Ikeda teaches values of less than (calculated) 5.6 nm for Rz are achievable, it appears that repeating the post polishing treatment of any substrate would yield further reduction of the roughness. One of ordinary skill in the art would have been motivated to perform further post polishing process steps, such as the ones in example 3 or example 4, in order to obtain a smoother surface on the substrate which is desirable for obtaining even lesser amount of asperity on the surface as

Claim Rejections - 35 USC § 103

2. Claims 6-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wada et al. (US 6,787,989), Nakaya et al (US 6,188,176) and Ikeda et al. (US 6,553,788) as applied to claim 5, and further in view of Ishibashi et al. (US 6,423,125) and Mitani et al (US 6,568,995).

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It is noted that Wada is silent about polishing.

As discussed above Ikeda teaches, "Then, the glass substrate was immersed in a 0.03 wt % aqueous hydrofluoric acid solution at 50.degree. C. for 30 minutes and rinsed with hot pure water to remove chemicals. Next cleaning in an aqueous potassium hydroxide solution was performed"

It is noted that the method of Ikeda is silent about a cerium oxide powder for polishing the transparent substrate and sulfuric and ascorbic acids washing.

The reference of Ishibashi teaches cerium oxide powder with predetermined mean particle diameter is conventionally used for polishing to obtain very smooth surfaces (column 5, line 47), and sulfuric acid and ascorbic acids are also used in the method and they are conventionally used in the art (column 4, line 30).

The reference of Mitani teaches a method of cleaning glass substrate, where it was found from experimental results, that the washing solution containing nitric acid and ascorbic acid gave a higher dissolving rate of lanthanoid oxides than other combinations.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Wada by adding a polishing step using cerium oxide powder and a cleaning step using a nitric acid and ascorbic acid mixture as described in the methods of Ishibashi and Mitani respectively because those methods are conventionally used for polishing of transparent surfaces for obtaining smooth surfaces as needed in the fabrication of magnetic disks and because reducing contaminants is also desirable. One of ordinary skill in the art would have been

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motivated to modify the method of Wada in order to obtain a cleaner and even smoother surface which is desirable.

Response to Arguments

3. Applicant's arguments, see page 2, filed 3/02/2007, with respect to the rejection(s) of claim(s) 1-13 under 35 USC § 103 have been fully considered and are persuasive in view of the reference of Akatsu was published on 9/14/2001 (not before applicant's claimed priority of 6/4/2001). Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Nakaya et al (US 6,188,176).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mahmoud Dahimene whose telephone number is (571) 272-2410. The examiner can normally be reached on week days from 8:00 AM. to 5:00 PM..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



MD.

NADINE NORTON
SUPERVISORY PATENT EXAMINER
ART UNIT 1765
